500mA LDO Linear Voltage Regulator

◆ DESCRIPTION

The MT1118 series is a Low dropout (LDO) linear regulator. The devices have been optimized for applications where fast transient response and minimum input voltages are critical.

At light loads the typical dropout voltage is 10mV, and at full load the maximum dropout voltage is less than 500mV. The internal over-current protection and thermal protection, makes the device extremely easy to use in a wide range of applications.

◆ FEATURES

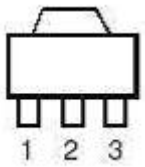
- Low dropout performance
- Output current of 500mA typical
- Thermal shutdown protection
- Fixed 1.5V/ 1.8V/ 2.5V/ 2.8V/ 3.0V/ 3.3V/3.6V output voltages available
- SOT-89,and SOT-23 packages available

◆ APPLICATIONS

- Active SCSI terminators
- Battery chargers
- High efficiency linear regulators
- Wireless communication systems
- Digital camera

◆ PIN CONFIGURATIONS

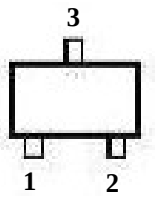
SOT-89 (Top View)



MT11181-X.XJ 1:OUT, 2:GND 3:IN

MT11182-X.XJ 1:GND, 2:IN, 3:OUT

SOT-23 (Top View)



MT11181.X.XS 1:OUT, 2:IN, 3:GND

MT11182-X.XS 1:GND, 2:OUT, 3:IN

◆ ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Maximum	Unit
Input supply voltage	V_{IN}	6	V
Thermal resistance junction to ambient SOT-89 SOT-23	θ_{JA}	 180 230	 °C/W °C/W
Junction temperature	T_J	150	°C
Storage temperature range	T_{STG}	-10 to 150	°C
Lead temperature (soldering) 10sec	T_{LEAD}	260	°C

Note:

Exceeding these ratings could cause damage to the device. All voltages are with respect to Ground. Currents are positive into, negative out of the specified terminal.

◆ ORDERING INFORMATION

Device	Package		Vout Volts	T_J (°C)
MT11181-X.XJ	J	SOT-89	X.X_1.5/1.8/2.5/2.8/3.0/3.3/3.6	-40 ~ 125
MT11182-X.XJ				
MT11181-X.XS	S	SOT-23	X.X_1.5/1.8/2.5/2.8/3.0/3.3/3.6	-40 ~ 125
MT11182-X.XS				

◆ POWER DISSIPATION TABLE

Package	θ_{JA} (°C /W)	$T_A \leq 25$°C Power rating(mW)	T_A=70°C Power rating(mW)	T_A= 85°C Power rating (mW)
J	180	694	444	361
S	230	543	348	283

Note :

1. Exceeding the maximum allowable power dissipation will result in excessive die temperature, and the regulator will go into Thermal shutdown
2. T_J Junction Temperature Calculation: $T_J = T_A + (P_D \times \theta_{JA})$,
   The θ_{JA} numbers are guidelines for the thermal performance of the device/PC-board system
   All of the above assume no ambient airflow
3. θ_{JA}: Thermal Resistance-Junction to Ambient, D_F: Derating factor, P_O: Power consumption.

◆ RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Operating Conditions			Unit
		Min.	Typ.	Max.	
Input Voltage	V_{IN}	2.8	-	5.5	V
Load Current (with adequate heat sinking)	I_O	5	-	-	mA
Junction temperature	T_J	-	-	125	°C

◆ ELECTRICAL CHARACTERISTICS

Operating Conditions: V_{IN} = 5V; I_{OUT} =10mA; T_J=25 °C, unless otherwise specified.(C_{OUT}=2.2μF, C_{IN}=2.2μF).

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_{OUT}	MT1118-1.5 (V_{IN} = 2.8V) MT1118-1.8 (V_{IN} = 2.8V) MT1118-2.5 MT1118-2.8 MT1118-3.0 MT1118-3.3 MT1118-3.6	1.455 1.746 2.424 2.716 2.910 3.201 3.492	1.5 1.8 2.5 2.8 3.0 3.3 3.6	1.545 1.854 2.575 2.884 3.090 3.399 3.708	V V V V V V V
Line Regulation	V_{SR}	V_{IN} =(V_{OUT} + 1)V to 5.5V	-	1	-	%
Load Regulation (2)	V_{LR}	V_{IN} =(V_{OUT} +1)V, I_{OUT}=10~250mA	-	1	-	%
		I_{OUT}=10~500mA	-	1.5	-	
Ground Current	I_{GND}	I_{OUT} = 10mA	-	100	-	uA
Dropout Voltage (3)	V_D	I_{OUT} = 500mA	-	0.8	-	V
Current Limit	I_{LIMIT}	V_{OUT} =0V	-	0.6	-	A
Output Voltage Temperature Coefficient	T_c	Note 1	-	50	-	ppm/ °C,
Thermal Protection	T_{PRO}	Thermal Protection Temperature	-	150	-	°C,
		Protection Hysterisys	-	20	-	
RMS Output Noise	V_N	T_A = 25 °Cμ 10Hz ≤ f ≤ 10kHz	-	0.003	-	%/V_O
Ripple Rejection Ratio	PSRR	f = 120Hz,	-	59	-	dB

NOTES:

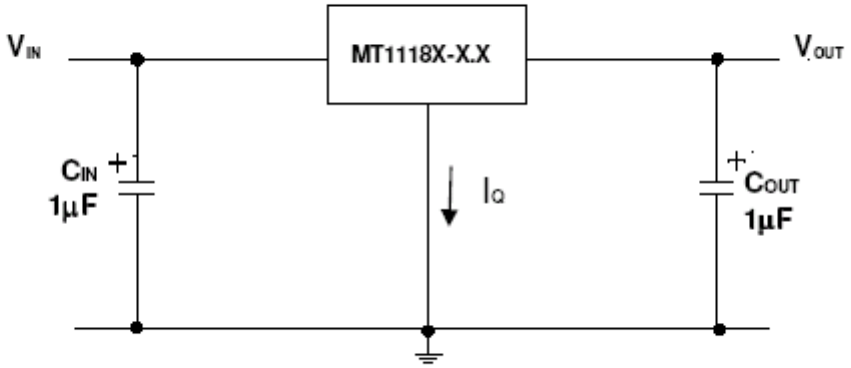
(1) Output voltage temperature coefficient is the worst case voltage change divided by the total temperature range.

(2) Regulation is measured at constant junction temperature using low duty cycle pulse testing. Parts are tested for load regulation in the load range from 100μA to 500mA. Changes in output voltage due to heating effects are covered by the thermal regulation specification.

(3) Dropout voltage is defined as the input to output differential at which the output voltage drops 2% below its nominal value measured at 1V differential.

◆ TYPICAL APPLICATIONS

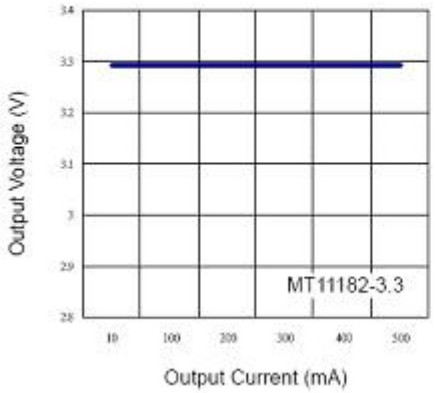
Fixed Voltage Regulator:



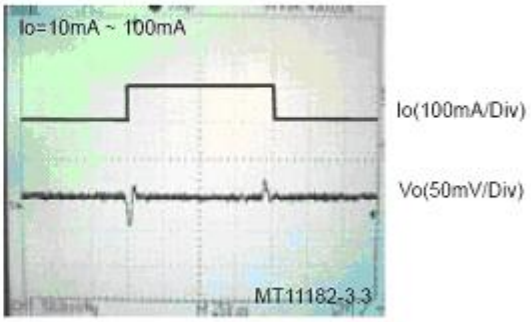
◆ APPLICATION NOTE

(1) Output voltage temperature coefficient is the worst case voltage change divided by the total temperature range.

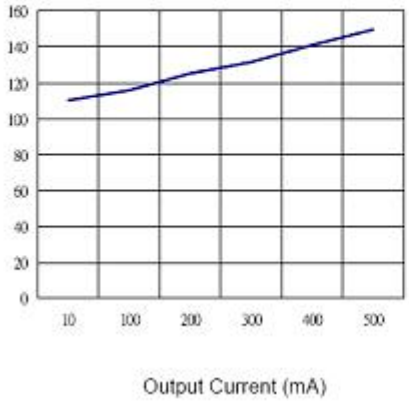
LOAD REGULATION



LOAD TRANSIENT RESPONSE

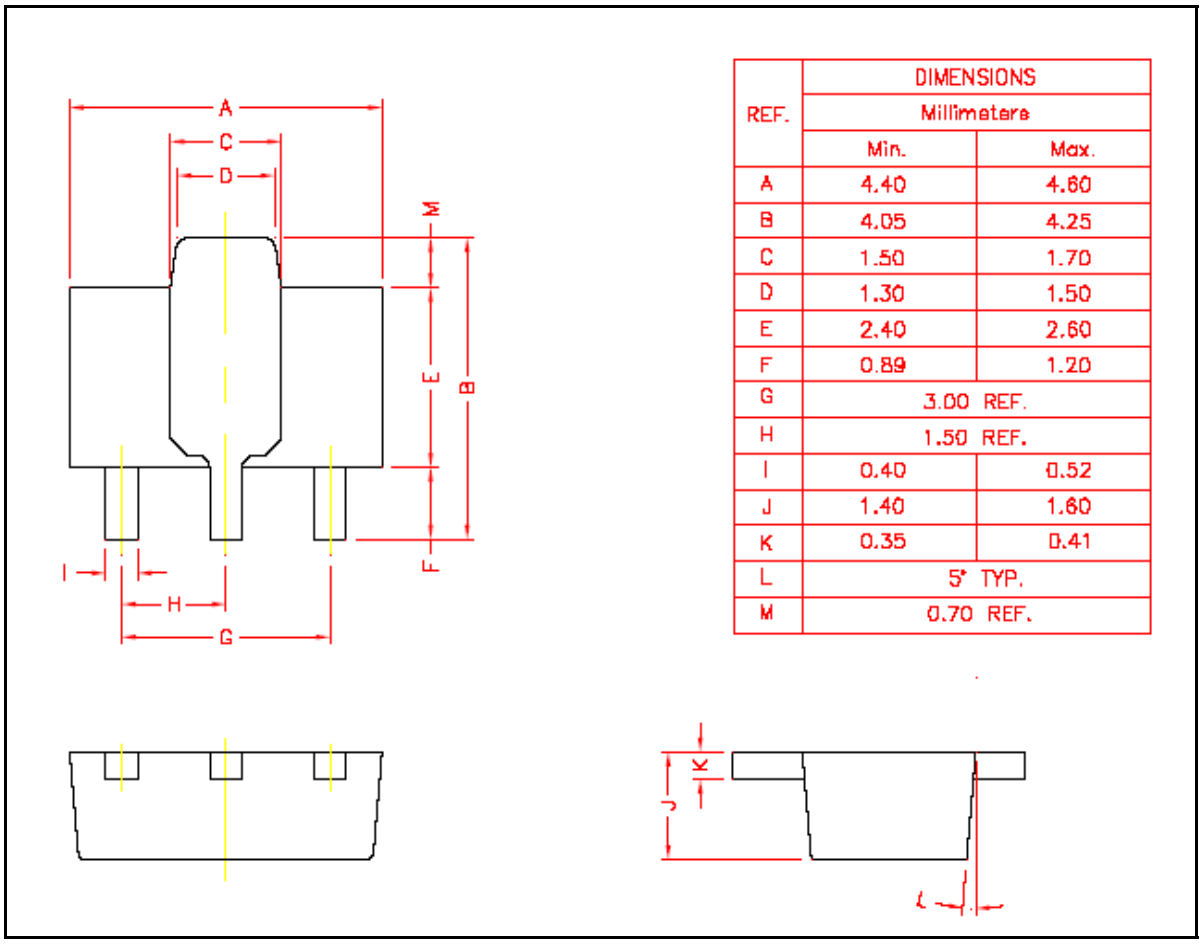


Quiescent Current vs IOUT



◆ PHYSICAL DIMENSIONS

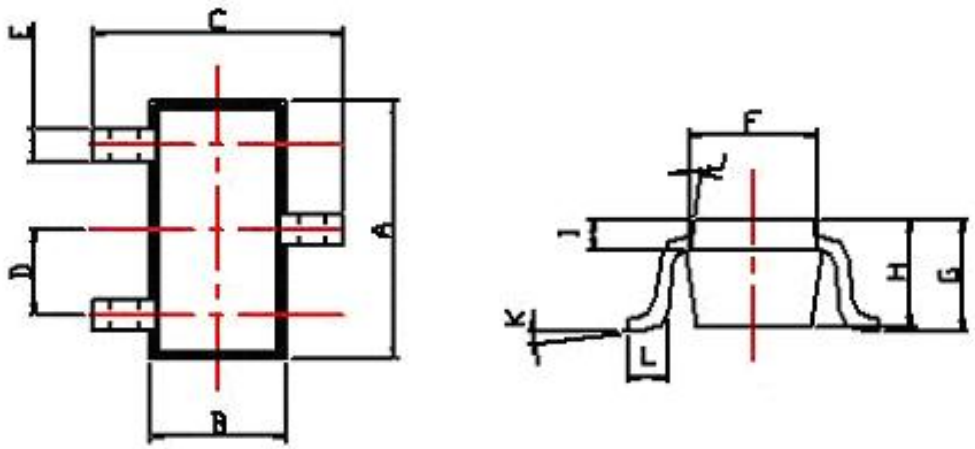
3-Pin surface Mount SOT-89(J)



REF.	DIMENSIONS Millimeters	
	Min.	Max.
A	4.40	4.60
B	4.05	4.25
C	1.50	1.70
D	1.30	1.50
E	2.40	2.60
F	0.89	1.20
G	3.00 REF.	
H	1.50 REF.	
I	0.40	0.52
J	1.40	1.60
K	0.35	0.41
L	5° TYP.	
M	0.70 REF.	

◆ PHYSICAL DIMENSIONS

3-Pin surface Mount SOT-23(S)



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.70	3.10	G	0.9	1.4
B	1.20	1.66	H	0.8	1.30
C	2.37	2.90	I	0.25	0.7
D	0.85	1.15	J	7 ± 2°.	
E	0.350 + 0.15/-0.05		K	0 ~ 10°.	
F	1.07	1.53	L	0.2 (MIN)	